

City of Raleigh
Engineering
Services
Department



Stormwater Management

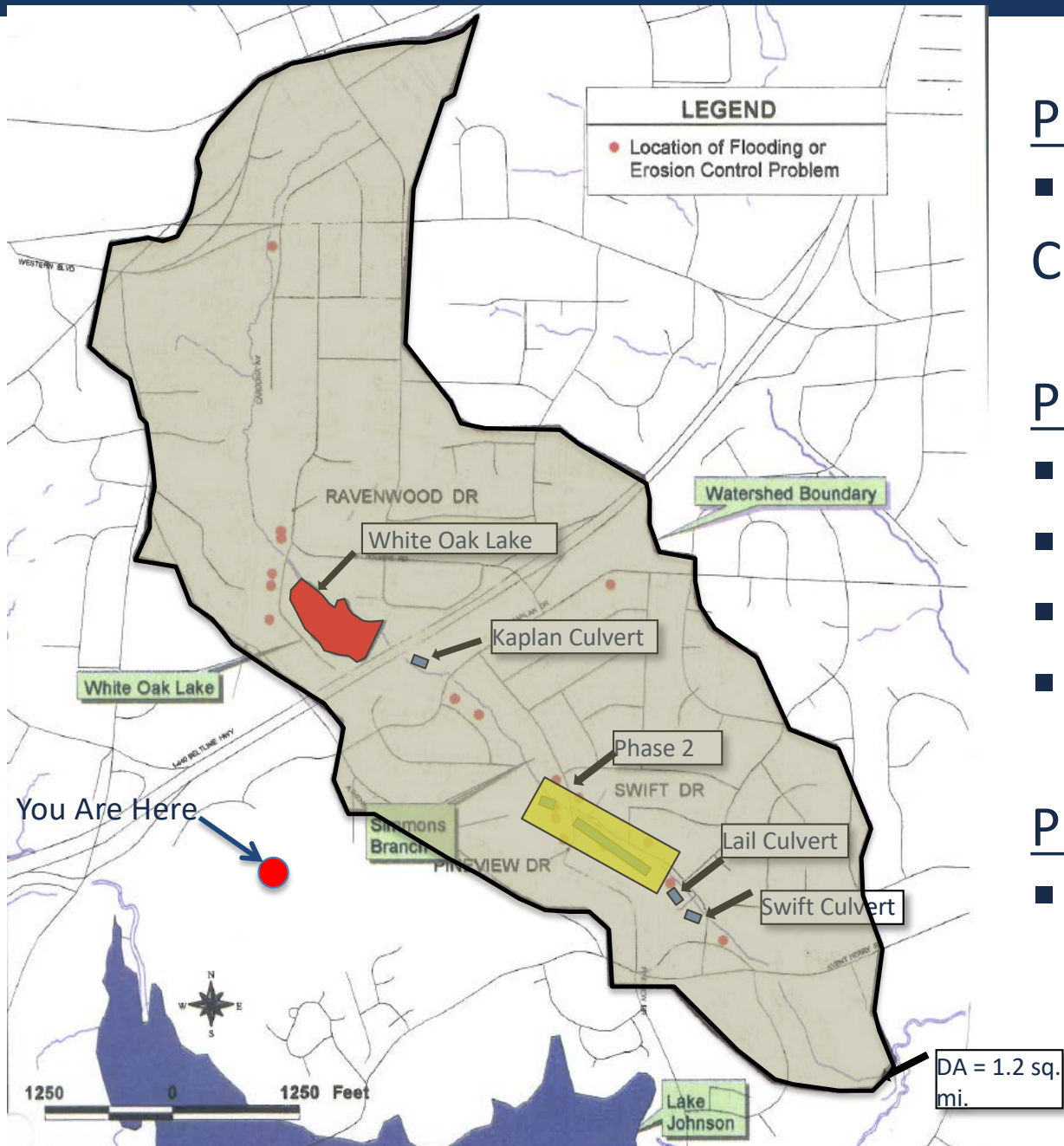


White Oak Lake Reconstruction Project

March 26, 2018

Public Meeting
At Thomas Woodland Center

Phasing and Project Orientation



Phase 1

- Lail, Kaplan, and Swift Culverts

Phase 2

- Pineview Drive Culvert
- Swift Drive Culvert
- Driveway Bridge
- Bank Stabilization

Phase 3

- White Oak Lake

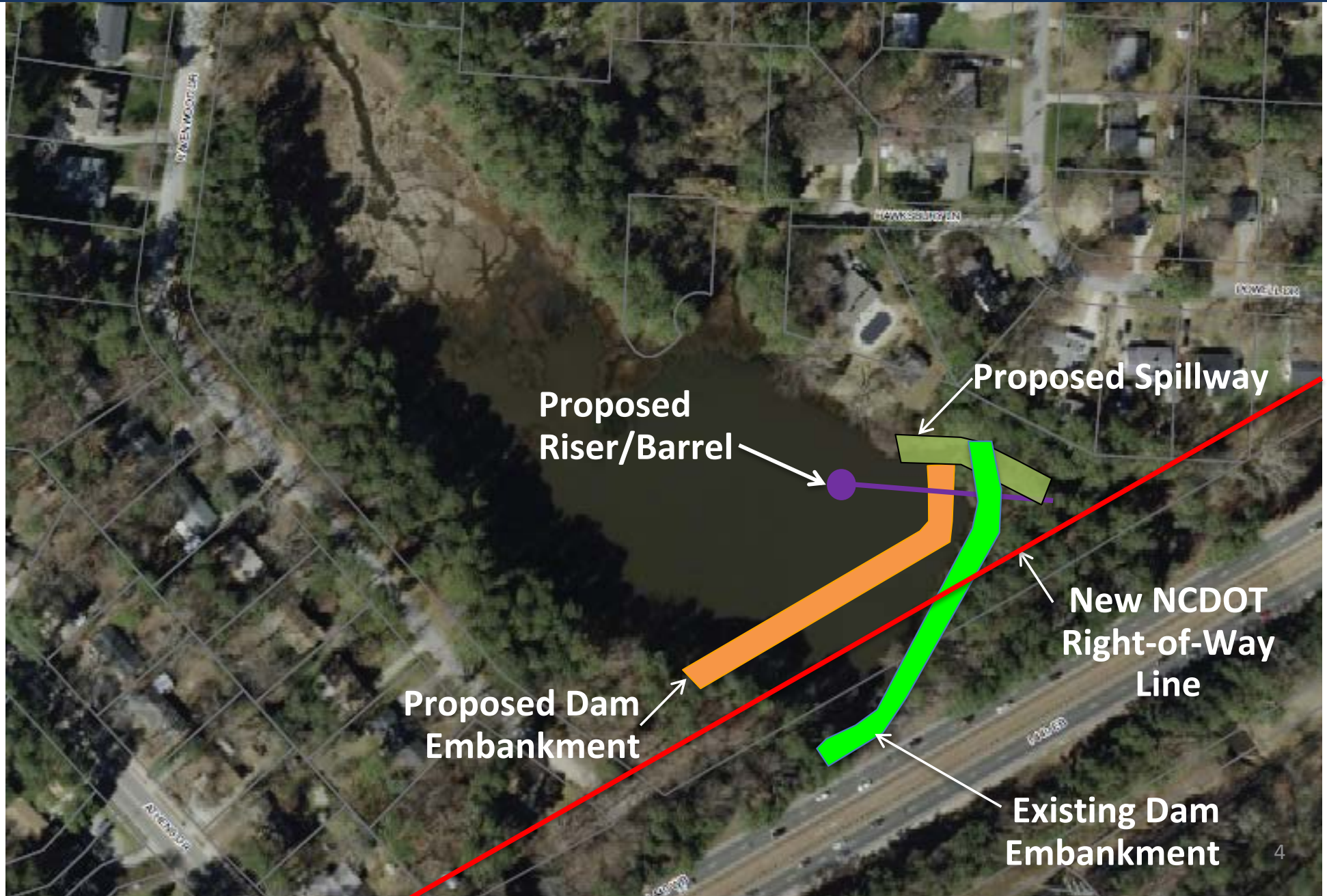
Project Objectives



1. Improve public safety
2. Reconstruct failing or missing lake controls (embankment, riser, emergency spillway)
3. Move embankment out of future NCDOT I-440 widening project
4. Address future maintenance challenges
5. Reduce downstream flooding
 - Eliminate roadway flooding for a 10-year flood
 - Minimize flooding of homes and yards



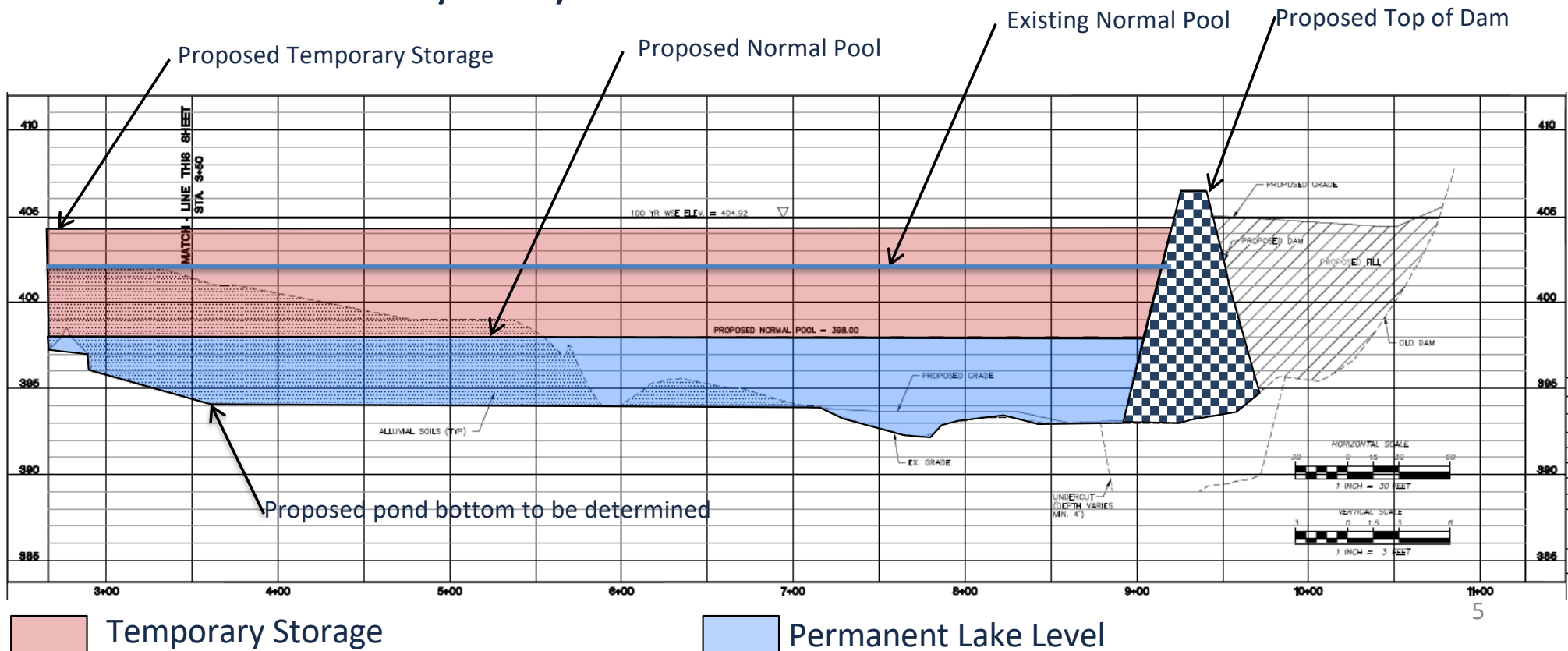
I-440 Right-of-Way Line



Flood Reduction



- Lower normal pool from 401.8' to 397.0'
- Raise emergency spillway from 402' to 403.3'
- Install new riser with 90" dia. Barrel
- Take temporary storage from 0 cf. to more than 1,500,000 cf.
- Peak flow is delayed by almost one hour



Current Lake



Failed Primary Spillway



Failed Primary Spillway



Failed Emergency Spillway



Failed Emergency Spillway



Tree Lined Dam Embankment



Design Objectives



Maintain lake footprint (if possible)

Target a normal pool depth of 3.0 ‘

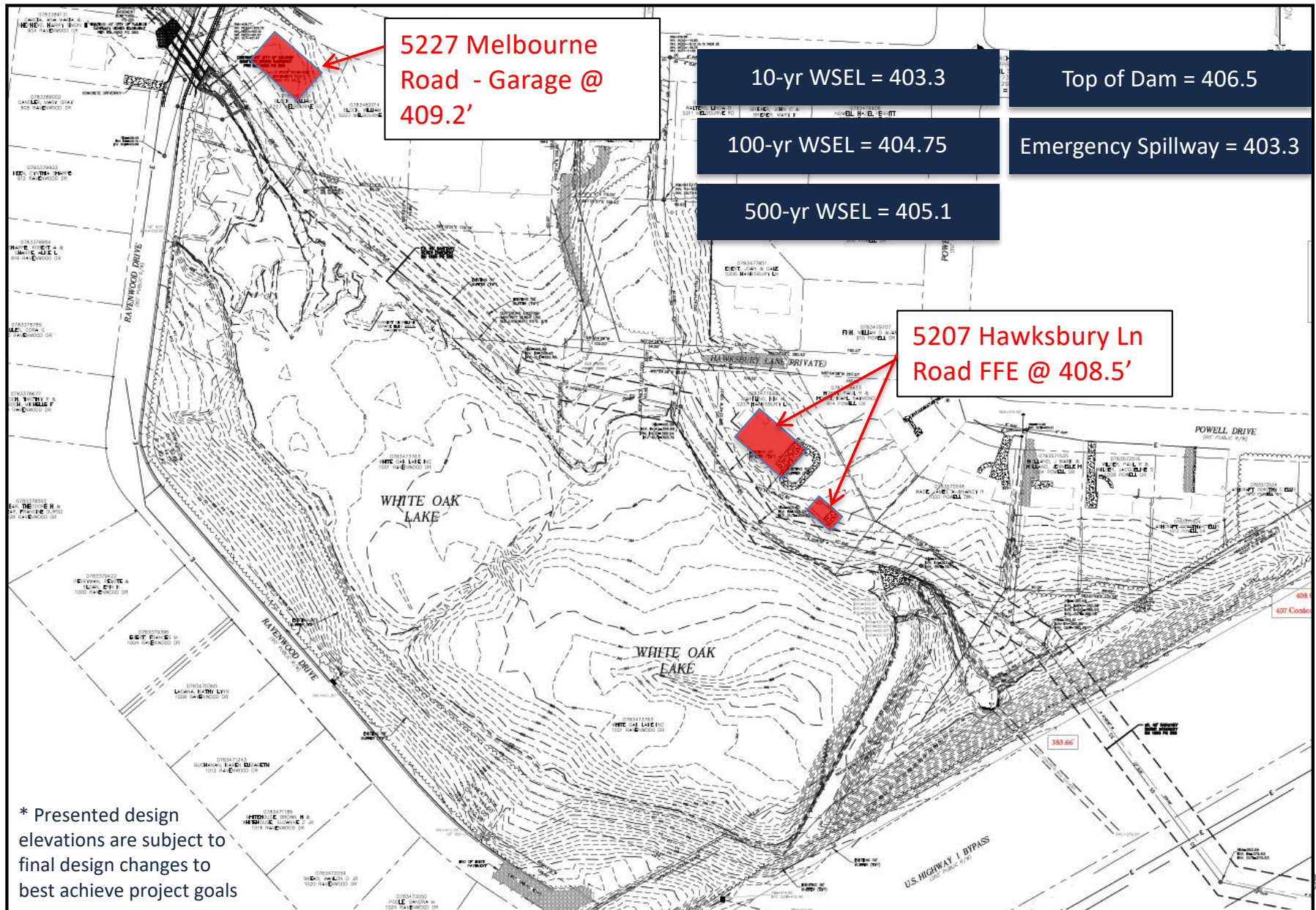
Reduce downstream flows

Convey 500-yr flood with 1.0’ of
freeboard on top of dam

Avoid flooding of FFE in 500-yr flood

Avoid garage flooding in the 100-yr
flood

Summary of Proposed WSELs



Summary of Flows Changes



Existing Conditions

10-yr $Q = 553$ cfs

100-yr $Q = 1112$ cfs

500-yr $Q = 1317$ cfs

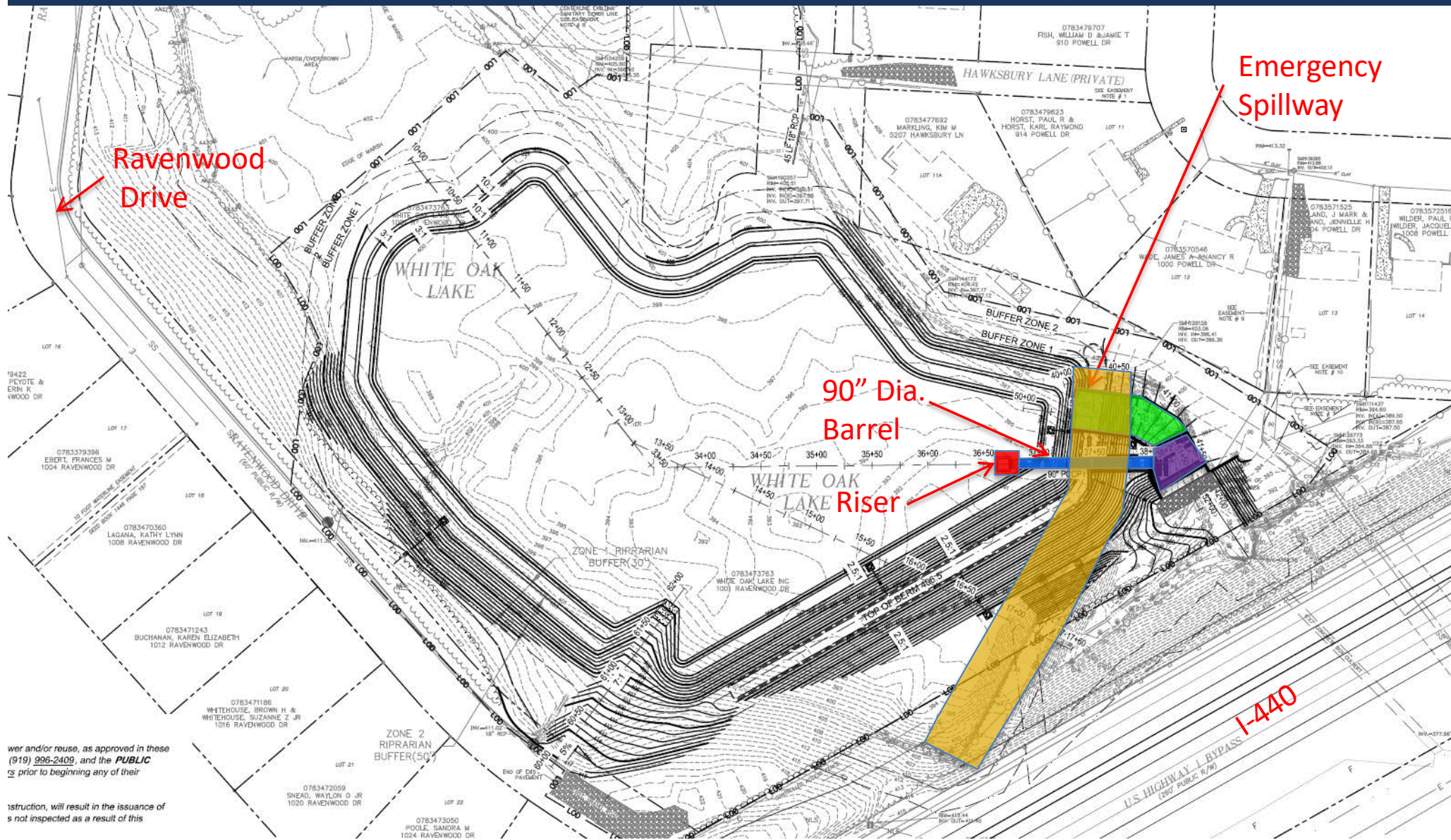
Proposed Conditions

10-yr $Q = 305$ cfs

100-yr $Q = 749$ cfs

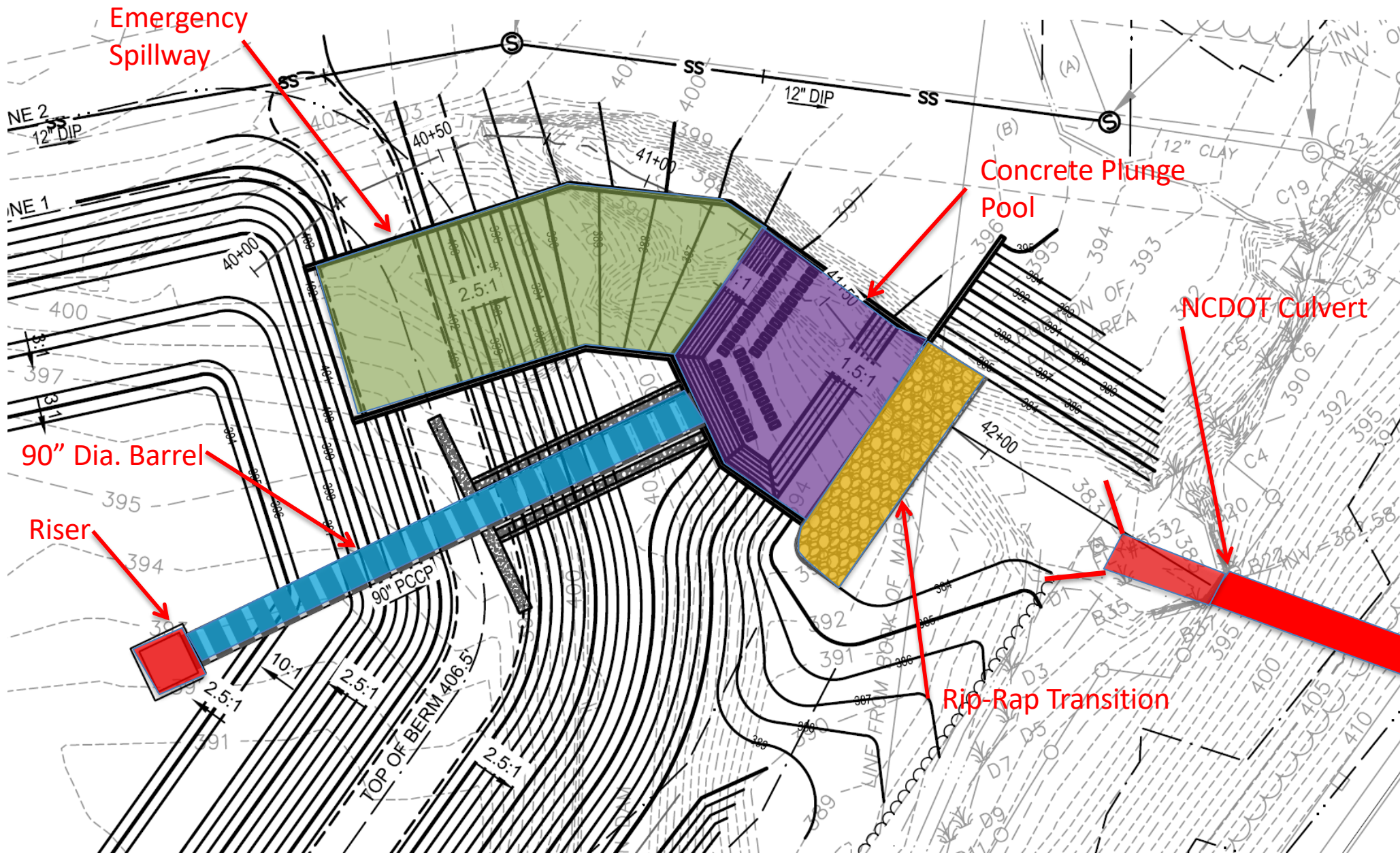
500-yr $Q = 882$ cfs

* Presented design flows are subject to final design changes to best achieve project goals





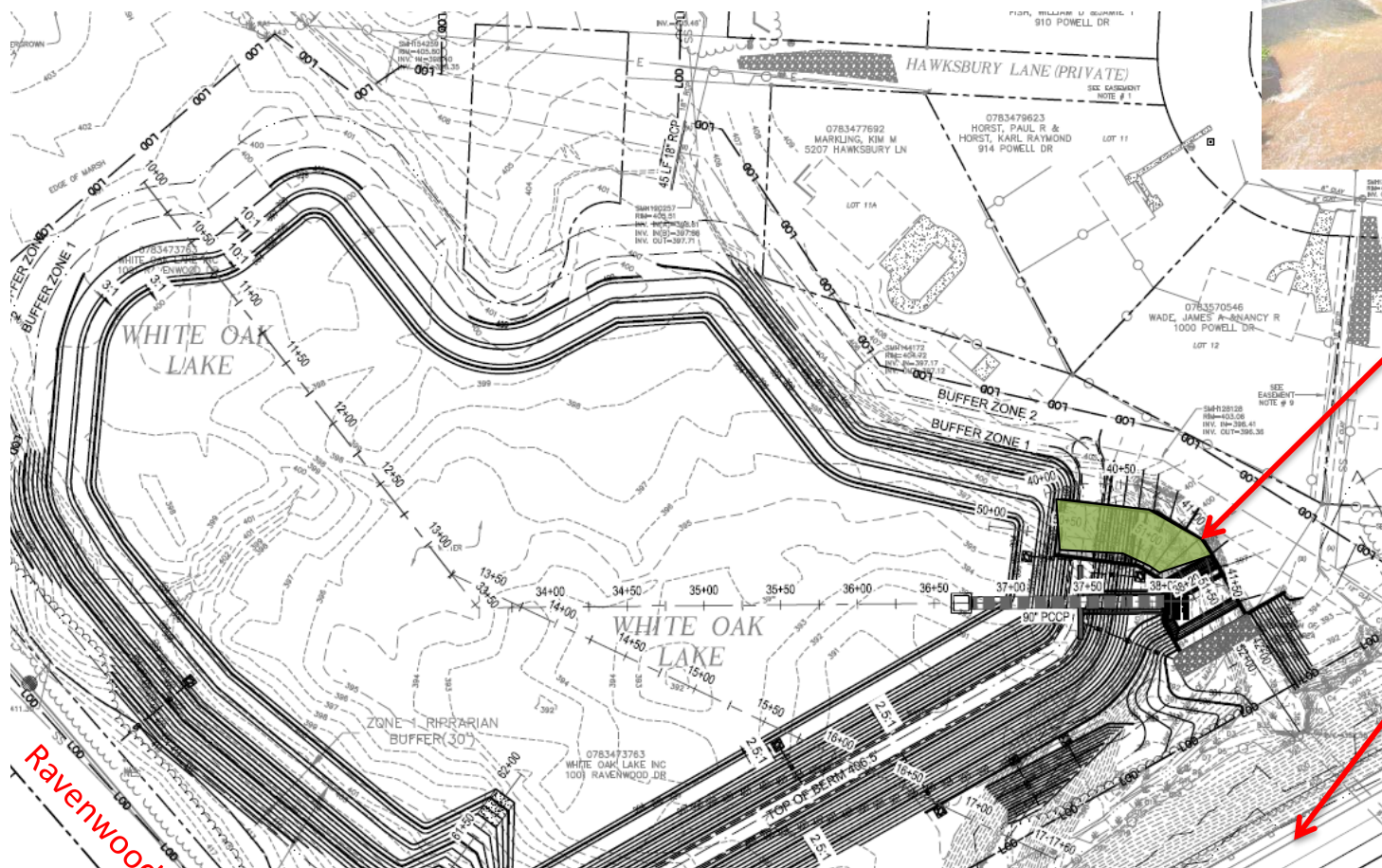
Proposed Emergency Spillway/Plunge Pool



Proposed Emergency Spillway



- 35' wide concrete lined spillway
- Crest elevation = 403.3'
- Top of dam elevation is 406.5'



Emergency Spillway

I-440

Proposed Riser/Barrel



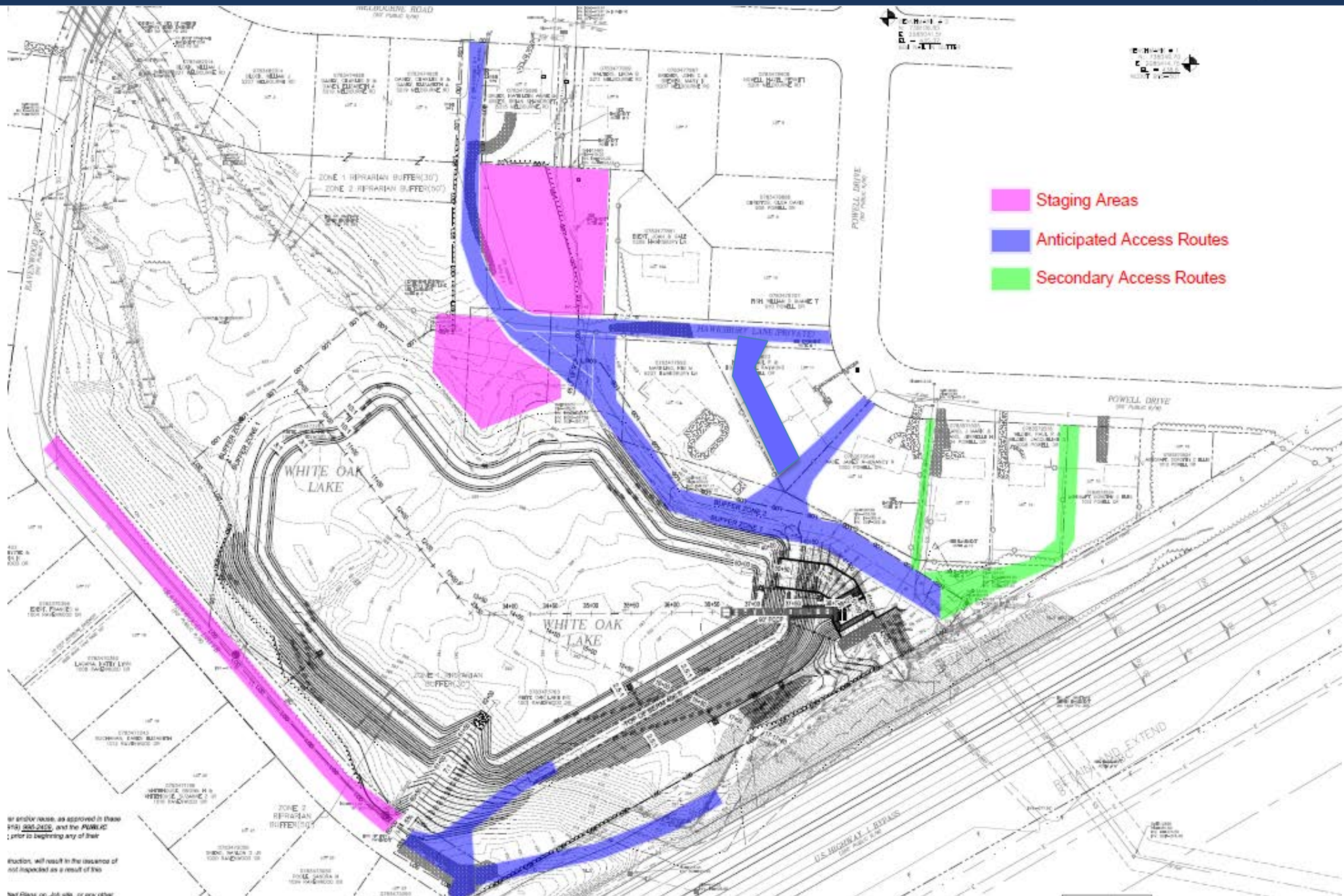
- 10'x10' concrete riser (vault)
- 90" dia. barrel (110 LF)
- Steel trash rack
- Anti-vortex plate



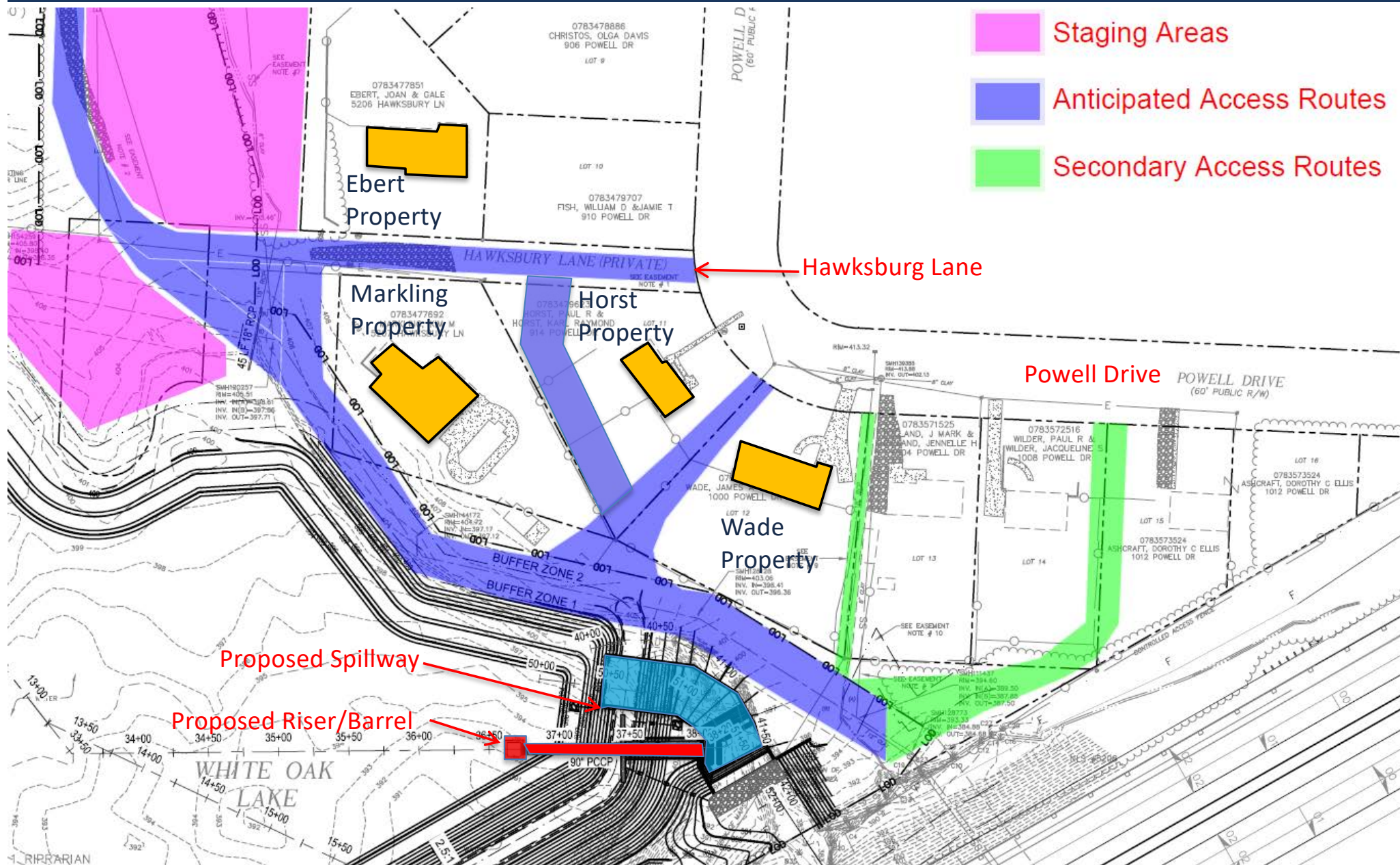




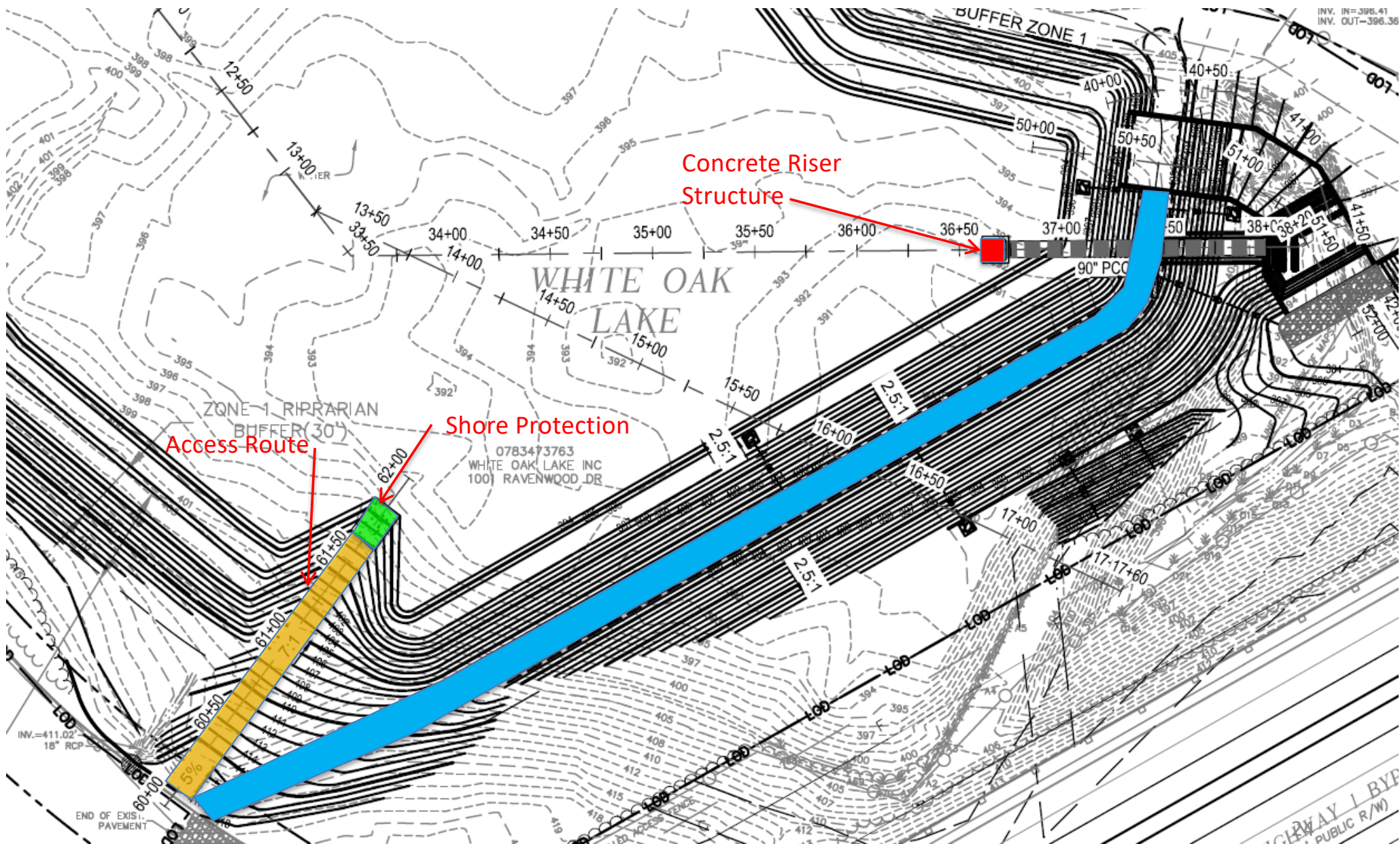
Construction Access Options



Construction Access Options



Maintenance Access

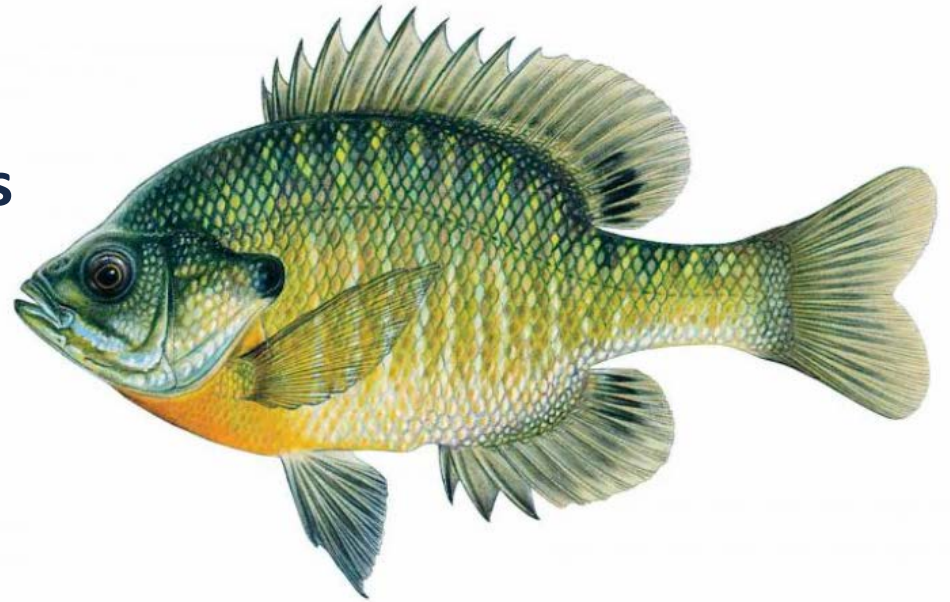


Fish Restocking



- Remove and Relocate
- Restock after Construction
- NC State Fisheries Guidelines

% of Adults &
% of Fingerlings



Dam Classification



Size = Small (total storage of 68 acre feet and height = 17 feet)

Hazard Classification = High



Regulated by NC Dam Safety

Emergency Operation Plan

Submittal for Dam Safety Permit



- **NC Dam Safety**
- **US Army Corps:**
 - **< ½ wetland impacts (PCN submittal – Nationwide Permit)**
- **NCDWR 401**
- **NCDENR Erosion Control Permit**
- **NCDOT Encroachment Permit**
- **City of Raleigh Permits**

Easement Acquisition



Easement Types

- Temporary Construction Easement (TCE)
- Permanent Sanitary Sewer Easement (PSE)
- Permanent Drainage Easement (PDE)

Easement Requirements

- Public Utilities – No structures (sheds, fences, etc.) in sanitary sewer easement
- Stormwater Management – Allow exceptions for fencing on a case-by-case basis

Project Schedule – White Oak Lake



March 2018: 65% design complete

March 26, 2018: Public meeting

March - June 2018: Private utility relocation, obtain permits, easement acquisition; finalized construction plan

May- June 2018: Project bid

August 2018: Project award

September: Project construction begins

October 2019: Project completed

Permits must be in hand to begin construction. Delays in receiving permits could delay start of construction. Dates reflect a projected schedule which may have to be adjusted to account for delays in acquiring permits and approvals to begin construction

Questions?



Questions?

Project Contact Information and Updates



City of Raleigh Stormwater Management Division

David Kiker
david.kiker@raleighnc.gov
Raleighnc.gov (Search "White Oak Lake")
RaleighStormwater@raleighnc.gov
919-996-4074